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Application No. 10/677,136
Attorney Ref.: 010030-001710US
Client Ref.: B02-067

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Previously presented) A method for simulation of light scattering in large three dimensional objects in a optical imaging system comprising the steps of:
 - a) decomposing a three dimensional object into a plurality of elementary two dimensional objects,
 - b) defining the two dimensional objects by edges of the objects,
 - c) applying edge domain decomposition for the edges of the two dimensional objects to identify light scattering by the one dimensional edges, and
 - d) summing scattered light from all edges to simulate light scattering in two dimensions.
2. (Previously presented) The method of claim 1 and further including:
 - e) spectrally mapping the edge domain decomposition.
3. (Previously presented) The method of claim 2 wherein the three dimensional object comprises a photo mask with multiple and interconnected openings.
4. (original) The method of claim 3 wherein step c) includes computational methods which speed-up calculations through use of table look-up of previously calculated objects and filtering that sequentially invokes more rigorous simulation as needed.
5. (original) The method of claim 4 wherein electromagnetic field from the diffraction of isolated edges is recycled in the synthesis of near diffracted field for arbitrary two dimensional diffracting geometries.

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6. (original) The method of claim 5 wherein the scattered field from all edges are summed to simulate light scattering in the two dimensional objects.

7. (original) The method of claim 6 wherein scattered light is polarized and step c) includes separate decomposition for light parallel to edges (TE) and for light perpendicular (TM) to edges.

8. (original) The method of claim 7 wherein step c) includes pre-simulating all distinct edges in the object with all possible illumination directions and field polarizations.

9. (original) The method of claim 8 wherein in step a) the two dimensional objects comprise rectangles.

10. (original) The method of claim 9 wherein the object is a phase shifting mask and step c) of pre-simulating light scattering from edges includes phase effects of etch depths in defining the phase shifting mask.

11. (original) The method of claim 10 wherein the simulation of light scattering is based on through the lens optical spectra.

12. (original) The method of claim 10 wherein the simulation of light scattering is based on a raised cosine function for the optical spectra.

13. (original) The method of claim 10 wherein the simulation of light scattering is based on a Gaussian function for the optical spectra.

14. (original) The method of claim 10 wherein the simulation of light scattering is based on a rect-function for the optical spectra.

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15. (original) The method of claim 3 wherein the object is a phase shifting mask and step c) includes pre-simulating light scattering from edges includes phase effects of etch depths in defining the phase shifting mask.

16. (original) The method of claim 15 wherein scattered light is polarized and step c) includes separate decomposition for light parallel to edges (TE) and for light perpendicular (TM) to edges.

17. (original) The method of claim 16 wherein step c) includes pre-simulating all distinct edges in the object with all possible illumination directions and field polarizations.

18. (original) The method of claim 1 wherein step c) includes pre-simulating all distinct edges in the object with all possible illumination directions and field polarizations.

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